

WHAT IS CLAIMED IS:

1. A magneto-resistive head comprising:
 - a first and second magnetic shield films;
 - a spin bulb film formed between the first and the second shield films via an insulation film;
 - a soft-magnetic film arranged to be in contact with both end portions of a free layer of the spin bulb film;
 - a permanent magnet film arranged so as to be in contact with the lower portion of the soft-magnetic film and not in contact with the free layer of the spin bulb film; and
 - an electrode film for applying a signal detection current to the spin bulb film.
2. The magneto-resistive head as claimed in Claim 1, wherein a distance between the end portion of the free layer of the spin bulb film and the end portion of the permanent magnet is not greater than 1.5 multiplied by a smaller distance among the distance between the permanent magnet film end portion and the first magnetic shield film and the distance between the permanent magnet film end portion and the second magnetic shield film.
3. The magneto-resistive head as claimed in Claim 1, wherein the soft-magnetic film has a saturation magnetic flux density not smaller than 0.8 multiplied by a saturation magnetic flux density of the free layer of the spin bulb film.

20067912.020002

4. The magneto-resistive head as claimed in Claim 1, wherein a product of the saturation magnetic flux density of the soft-magnetic film multiplied by the film thickness is 1 to 10 multiplied by the product of the saturation magnetic flux density of the free layer of the spin bulb film multiplied by the film thickness.

5. A magneto-resistive head comprising:
a first and second magnetic shield films;
a spin bulb film formed between the first and the second shield films via an insulation film;
a soft-magnetic film arranged to be in contact with both end portions of a free layer of the spin bulb film;
a anti-ferromagnetic film arranged so as to be in contact with the lower portion of the soft-magnetic film and not in contact with the free layer of the spin bulb film; and
an electrode film for applying a signal detection current to the spin bulb film.

6. A magneto-resistive head production method comprising steps of:

forming a first magnetic shield film and a first insulating film;

forming a spin bulb film on the first insulation film;

forming a lift-off resist for patterning the spin bulb film;

2025 RELEASE UNDER E.O. 14176

patterning the spin bulb film by ion milling;
 successively forming a permanent magnet film,
 a soft-magnetic film, and an electrode film on the
 first insulating film, the spin bulb film, and the
 lift-off resist which have been patterned;

 removing the lift-off resist and the
 permanent magnet film, the soft-magnetic film, and the
 electrode film which are attached onto the lift-off
 resist; and

 forming a second insulating film and a second
 magnetic shield film on the electrode film and the spin
 bulb film;

 wherein an ion injection angle IM1 with
 respect to the substrate normal direction during the
 ion milling, an angle D1 as a film forming particle
 injection angle for forming the permanent magnet film
 with respect to the substrate normal, and an angle D2
 as a film forming particle injection angle for forming
 the soft-magnetic film with respect to the substrate
 normal are in relationships as follows: D1 is smaller
 than IM1, and IM1 is not greater than D2.

2000201262#0001